RECEIVED
CENTRAL FAX CENTER
OCT 20 2008

Status of the Claims

Please amend claims 1-24 and 26-28; and withdraw claims 19-29; all without prejudice or disclaimer, as indicated in the following Listing of Claims.

Listing of Claims

1. **(Currently amended)** A drive circuit ~~(20a,20b)~~ for an injector arrangement having at least one injector ~~(12a,12b)~~, the drive circuit comprising:

a first charge storage ~~means~~ device configured and arranged ~~(C2)~~ for operative connection with one of the at least one injectors ~~(12a,12b)~~ during a discharging phase so as to permit a discharge current to flow therethrough, thereby to initiate an injection event;

a second charge storage ~~means~~ device configured and arranged ~~(C1)~~ for operative connection with the at least one injector ~~(12a,12b)~~ during a charging phase so as to cause a charge current to flow therethrough, thereby to terminate the injection event;

a switch controller ~~means~~ ~~(Q1,Q2)~~ configured and arranged for controlling whether the first charge storage ~~means~~ device ~~(C2)~~ is operably connected to the at least one injector or whether the second charge storage ~~means~~ device ~~(C1)~~ is operably connected to the at least one injector;

a first voltage rail ~~(V.sub.0,V.sub.supply)~~ at a first voltage level;

a second voltage rail ~~(V.sub.1)~~ at a second voltage level higher than the first voltage level;

a voltage supply ~~means~~ ~~(22,36)~~; and

a regeneration switch ~~means~~ ~~(Q5,Q2, L1)~~ configured and arranged to be operable at the end of the charging phase to transfer charge from the voltage supply ~~means~~ to at least the second charge storage device via an energy storage device ~~(L1)~~, prior to a subsequent discharging phase.

2. **(Currently amended)** The drive circuit ~~(20a,20b)~~ as claimed in claim 1, wherein the first charge storage ~~means~~ device ~~(C2)~~ is connected across the first voltage rail ~~(V.sub.0,V.sub.supply)~~ and ground.

3. **(Currently amended)** The drive circuit ~~(20a,20b)~~ as claimed in claim 1 ~~or claim 2~~, wherein the second charge storage ~~means~~ device ~~(C1)~~ is connected across the first ~~(V.sub.0,V.sub.supply)~~ and second ~~(V.sub.1)~~ voltage rails.

4. **(Currently amended)** The drive circuit ~~(20a,20b)~~ as claimed in ~~any preceding~~ claim 1, further comprising a switch ~~means~~ arrangement including a first switch ~~(Q1)~~ operable to close so as to activate the charging phase, and a second switch ~~(Q2)~~ operable to close so as to activate the discharging phase.

5. **(Currently amended)** The drive circuit ~~(20a)~~ as claimed in ~~any preceding~~ claim 4, wherein the regeneration switch ~~means~~ ~~(Q5,Q2,L1)~~ is operable at the end of the charging phase to transfer charge from the voltage supply ~~means~~ ~~(22)~~ to the first charge storage ~~means~~ device ~~(C2)~~ and the second charge storage ~~means~~ device ~~(C1)~~.

6. **(Currently amended)** The drive circuit ~~(20b)~~ as claimed in ~~any of~~ claims ~~1 to~~ 4, wherein the regeneration switch ~~means~~ ~~(Q5,Q2,L1)~~ is operable at the end of the charging phase to transfer charge from the voltage supply ~~means~~ to the first charge storage ~~means~~ device ~~(C2)~~, and from the first charge storage ~~means~~ device ~~(C2)~~ to the second charge storage ~~means~~ device ~~(C1)~~ via the energy storage device ~~(L1)~~.

7. **(Currently amended)** The drive circuit ~~(20a)~~ as claimed in claim 5, wherein the regeneration switch ~~means~~ ~~(Q5,Q2,L1)~~ is operable to transfer charge from the voltage supply ~~means~~ ~~(22)~~ to the first ~~(C2)~~ and second ~~(C1)~~ charge storage ~~means~~ devices in response to the operation of the second switch ~~(Q2)~~ during the regeneration phase.

8. **(Currently amended)** The drive circuit ~~(20b)~~ as claimed in claim 6, wherein the regeneration switch ~~means~~ ~~(Q5,Q2,L1)~~ is operable to transfer charge from the voltage supply ~~means~~ ~~(22,36)~~ to the first charge storage ~~means~~ device ~~(C2)~~ in response to the operation of the second switch ~~(Q2)~~ during the regeneration phase.

9. **(Currently amended)** The drive circuit ~~(20a,20b)~~ as claimed in ~~any preceding~~ claim 1, wherein the first ~~(C2)~~ and second ~~(C1)~~ charge storage ~~means~~ devices comprise capacitors.

10. **(Currently amended)** The drive circuit ~~(20a,20b)~~ as claimed in ~~any preceding~~ claim 1, further comprising first ~~(12a)~~ and second ~~(12b)~~ injectors ~~which~~ that are arranged in parallel and operatively connected to the switch ~~means~~ controller ~~(Q1,Q2)~~, the regeneration switch ~~means~~ ~~(Q5,Q2,L1)~~, and a further switch ~~means~~ ~~(Q3,Q4)~~ for controlling independent selection of the first ~~(12a)~~ or second ~~(12b)~~ injector to permit a discharge current to be supplied to the selected injector ~~(12a,12b)~~ during a discharging phase so as to initiate an injection event.

11. **(Currently amended)** The drive circuit ~~(20a,20b)~~ as claimed in claim 10, wherein the drive circuit is substantially configured as a half H-bridge circuit having a middle circuit branch ~~(32)~~, with the first ~~(12a)~~ and second ~~(12b)~~ injectors being arranged in parallel in the middle circuit branch.

12. **(Currently amended)** The drive circuit ~~(20a,20b)~~ as claimed in claim 10 ~~or claim 11~~, further comprising a voltage ~~sensing means~~ sensor configured and arranged for sensing the voltage across each injector ~~(12a,12b)~~, and a control ~~means~~ configured and arranged for receiving a signal indicative of the sensed voltage.

13. **(Currently amended)** The drive circuit ~~(20a,20b)~~ as claimed in claim 12, wherein the control ~~means~~ is arranged to provide a terminate control signal to the further switch ~~means~~ ~~(Q3,Q4)~~ to terminate the charging phase of the selected injector once a predetermined charge threshold voltage ~~(V.sub.CHARGE)~~ is sensed.

14. **(Currently amended)** The drive circuit ~~(20a,20b)~~ as claimed in claim 13, wherein the control ~~means~~ is further arranged to provide an initiate signal to the switch ~~means~~ controller ~~(Q1,Q2)~~ to initiate the charging phase of the selected injector.

15. **(Currently amended)** The drive circuit ~~(20a,20b)~~ as claimed in claim 13 ~~or claim 14~~, wherein the control ~~means~~ is arranged to provide an initiate signal to the regeneration switch ~~means~~ ~~(Q5,Q2,L1)~~ to initiate the regeneration phase, and to provide a termination signal to the regeneration switch ~~means~~ to terminate the regeneration phase.

16. **(Currently amended)** The drive circuit ~~(20a,20b)~~ as claimed in claim 14, wherein the control ~~means~~ is further arranged to provide a terminate control signal to the further switch ~~means~~ ~~(Q3,Q4)~~ to terminate the discharging phase of the selected injector once a predetermined discharge threshold voltage ~~(V.sub.DISCHARGE)~~ is sensed.

17. **(Currently amended)** The drive circuit ~~(20a,20b)~~ as claimed in claim 16, wherein the control ~~means~~ is further arranged to provide an initiate control signal to the switch ~~means~~ controller ~~(Q1,Q2)~~ to initiate the discharging phase of the selected injector.

18. **(Currently amended)** The drive circuit ~~(20a,20b)~~ as claimed in ~~any of~~ claims 12 ~~to 17~~, wherein the control ~~means~~ is arranged to provide a pulse width modulated signal to alternately provide enable and disable signals to the switch ~~means~~ controller ~~(Q2)~~ during the regeneration phase, thereby to transfer energy to and from the energy storage device ~~(L1)~~.

19. **(Withdrawn and currently amended)** The drive circuit ~~(20a,20b)~~ as claimed in ~~any preceding~~ claim 1, wherein the at least one injector ~~(12a,12b)~~ comprises a piezoelectric actuator.

20. **(Withdrawn and currently amended)** A control method for an injector arrangement having at least one injector ~~(12a,12b)~~, the method comprising:

operably connecting a first charge storage ~~means~~ device ~~(C2)~~ to one of the at least one injectors during a discharging phase so as to cause a discharge current to flow therethrough, thereby to initiate an injection event;

operably connecting a second charge storage ~~means~~ device ~~(C1)~~ with the at least one injector during a charging phase so as to cause a charge current to flow therethrough, thereby to terminate the injection event;

activating a regeneration switch ~~means~~ ~~(Q5,Q2)~~ at the end of the charging phase to initiate a regeneration phase wherein charge is transferred from a voltage supply ~~means~~ ~~(22,36)~~ to an energy storage device ~~(L1)~~, and transferred from the energy storage device ~~(L1)~~ to at least the second charge storage ~~means~~ device ~~(C1)~~ prior to the subsequent discharging phase; and deactivating the regeneration switch ~~means~~ to terminate the regeneration phase.

21. **(Withdrawn and currently amended)** The control method as claimed in claim 20, wherein during the activating step charge is transferred from the voltage supply ~~means~~ ~~(22)~~ to the energy storage device ~~(L1)~~, and subsequently transferred from the energy storage device ~~(L1)~~ to the first ~~(C2)~~ and second ~~(C1)~~ charge storage ~~means~~ devices.

22. **(Withdrawn and currently amended)** The control method as claimed in claim 20, wherein during the activating step charge is transferred from the voltage supply ~~means~~ ~~(22)~~ to the first charge storage ~~means~~ device ~~(C2)~~, and subsequently transferred from the first charge storage ~~means~~ device ~~(C2)~~ to the energy storage device ~~(L1)~~ for transfer to the second charge storage ~~means~~ device ~~(C1)~~.

23. **(Withdrawn and currently amended)** The control method as claimed in ~~any of~~ claims 20 ~~to 22~~, wherein the steps of transferring charge to and from the energy storage device ~~(L1)~~ are carried out periodically.

24. **(Withdrawn and currently amended)** The control method as claimed in claim 23, wherein the steps of transferring charge to and from the energy storage device ~~(L1)~~ are carried out under the control of a pulse-width modulated signal.

25. **(Withdrawn)** The control method as claimed in claim 24, including the further step of varying the duty cycle of the pulse width modulated signal.

26. **(Withdrawn and currently amended)** The control method as claimed in ~~any of~~ claims 20 ~~to 25~~, including the further step of controlling whether the first ~~(C2)~~ or second ~~(C1)~~ charge storage ~~means~~ device is operably connected to the at least one injector ~~(12a,12b)~~.

27. **(Withdrawn and currently amended)** The control method as claimed in ~~any of~~ claims 20 ~~to 26~~, including the further step of providing a regeneration initiate signal to activate the regeneration switch ~~means (Q5,Q2)~~ so as to initiate the regeneration phase.

28. **(Withdrawn and currently amended)** The control method as claimed in claim 27, including the further step of providing a regeneration terminate signal to deactivate the regeneration switch ~~means (Q5,Q2)~~ so as to terminate the regeneration phase.

29. **(Withdrawn)** The control method as claimed in claim 27, wherein the regeneration initiate signal is provided after a predetermined number of injection events.